

## Plumage differences and taxonomic status of three similar *Circaetus* snake-eagles

by William S. Clark

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Three similar taxa of snake-eagles, Short-toed Snake-eagle, *Circaetus gallicus*, Black-breasted Snake-eagle, *C. pectoralis* and Beaudouin's Snake-eagle, *C. beaudouini*, were long thought by most authorities to be separate species because of differences in adult and juvenile plumages. They have allopatric breeding ranges. Beaudouin's Snake-eagle is resident in West and Central Africa, Black-breasted Snake-eagle is resident in East and southern Africa and Short-toed Snake-eagle breeds from southern Europe and northern Africa east to India. Northern and western populations of the Short-toed are migratory, moving into the ranges of the other two taxa during the northern winter (Meyburg *et al.* 1996, Brown *et al.* 1982).

Peters (1931) treated the three taxa as subspecies of a single species, without presenting reasons or citations for doing so. Meinertzhagen (1951), Brown and Amadon (1968), Stresemann and Amadon (1979), Brown *et al.* (1982) and Amadon and Bull (1988) followed this treatment, all without any arguments presented for doing so. However, other authorities continued to consider them separate species (e.g. Mackworth Praed & Grant 1962, White 1965, Cramp & Simmons 1980), all giving the argument of differences in plumage.

Brown (1974) agreed that the adults of the three taxa are distinctive but reported five instances of supposed interbreeding among the taxa in support of the single species view: two of *pectoralis* × *beaudouini*, two of *beaudouini* × *gallicus* and one of *gallicus* × *pectoralis*. Brown (1974) was cited as justification for single-species treatment by Brown *et al.* (1982) and the odd arrangement in Sibley & Monroe (1990) with *pectoralis* as a separate species and *beaudouini* placed within *gallicus*. However, Brown's (1974) descriptions of the alleged adults of *beaudouini* and *gallicus* were not detailed and his identifications cannot be verified. Most likely he was not aware that *pectoralis* has a subadult plumage that appears much like the adult of *gallicus* and somewhat like that of *beaudouini*; it is described and well depicted in Finch-Davies & Kemp (1980) and Newman (1983: 160–161) and described but not depicted in del Hoyo *et al.* (1994) and Zimmerman *et al.* (1996). All of his alleged cases of interbreeding can be explained by adult *pectoralis* breeding with subadult *pectoralis* or pairs of subadult *pectoralis*.

Some taxonomic treatments of the Falconiformes (e.g., del Hoyo *et al.* 1994) consider the three taxa to be separate species. To support that view, I offer arguments against the claimed interbreedings reported in Brown (1974).

## Methods

I have examined over two hundred specimens of all three taxa in numerous museums, including the Natural History Museum, Tring (BMNH), Transvaal Museum, Kenya Natural History Museum and the American Museum of Natural History. I have observed and taken photographs of all three taxa in the field: Short-toed Snake-eagle in Israel, Spain and India, Beaudouin's Snake-eagle in Senegal and Black-breasted Snake-eagle in South Africa, Botswana, Kenya and Zimbabwe.

## Results

Adults of all three taxa are distinctive and easily distinguished by the markings on their lower underparts, as depicted, for example, in Brown & Amadon (1968). The bellies of Black-breasteds are unmarked, those of Beaudouin's have narrow dark bars and those of Short-toed have wider dark blobs. There are other differences, especially in dorsal and breast colour; this is darkest and almost black on Black-breasted, darker brown on Beaudouin's and paler brown on Short-toed, with males of the latter usually showing pale vertical streaks in the dark breast. (The adult Beaudouin's depicted in del Hoyo *et al.* (1994) is not correct; it should have a much darker head, breast and upperparts and fewer, longer dark belly stripes.) Further differences lie in the markings on the underwings. Short-toeds have rufous to dark brown markings on the wing linings (Cramp & Simmons 1980: 112, Porter *et al.* 1981: 78–79), a feature not found on the other two. Beaudouin's and Black-breasteds both have white secondaries with three black bars (Zimmerman *et al.* 1996). Short-toeds have white secondaries with three incomplete dark bars.

Black-breasted Snake-eagles have an intermediate or subadult plumage that is different from those of juvenile and adult. This plumage is similar to that of the Short-toed Snake-eagle in having a dark breast forming a bib and short dark blobs on the belly (shown in Finch-Davies & Kemp 1980 on plate 32 and Newman 1983: 161). Subadult Black-breasted Snake-eagles can be distinguished from Short-toed Snake-eagles by their lack of markings on the underwing coverts, a feature present on even the palest Short-toed Snake-eagle. I have seen this subadult plumage several times in the field and in dozens of specimens, including at least three in the BMNH.

Juveniles of all three taxa are similarly easy to separate. Short-toeds are the most distinctive, appearing very similar to adults (Cramp & Simmons 1980). They differ from adults only in having a more yellowish eye colour and a rufous cast to the breast. Further, they lack the outermost dark band near the tips of the secondaries. Juveniles of the other two are quite different from adults; Black-breasted Snake-eagles have brown upperparts and rufous underparts, the latter sometimes with whitish mottling (Zimmerman *et al.* 1996), whereas Beaudouin's Snake-eagles are overall a darker brown (Serle & Morel 1977). The colour differences are easily seen on specimens and in the field.

## Discussion

Brown (1974) based his classification of these three taxa as a single species on his observations of what he interpreted as interbreedings of mixed pairs. However, all of his observations can be explained by misidentifications of subadult Black-breasted Snake-eagles as adults of the other taxa. Brown (1974) provided little in the way of detailed descriptions of the breeding eagles in question other than to state that his alleged adult Beaudouin's and Short-toed Snake-eagles had barred underparts and, further, provided no specimens nor published photographic evidence, other than to note that one pair was photographed by J. Hunter Sutherland, with no indication where these photographs are stored.

Brown (1974) also states that some specimens in the BMNH suggest that intermediates between *beaudouini* and *pectoralis* occur. I have studied specimens of all and found that all are easily assigned as to taxon.

The species account in del Hoyo *et al.* (1994) incorrectly states that the juvenile Beaudouin's is overall pale with a pale head. This is most likely due to the misidentified juvenile *gallicus* that I found with the *beaudouini* in the BMNH. Four juvenile specimens and one almost fully feathered nestling of *beaudouini* in the BMNH are all overall dark brown, as described by Serle & Morel (1977).

Interbreeding between *pectoralis* and *beaudouini* near their distributional boundaries is always a possibility. Voous (1996) reports an adult specimen of *beaudouini* collected within the range of *pectoralis* in Uganda, but his description was vague. C. Roselaar confirmed the identification of this specimen.

Comparison of the DNA among these taxa is the next step. Helbig & Seibold (pers. comm.) have compared the mitochondrial DNA of *pectoralis* and *gallicus* and found their differences to be well above the species level. They will publish these results later.

Short-toed, Black-breasted and Beaudouin's Snake-Eagles differ sufficiently in plumage to be considered as separate species, as was done by del Hoyo *et al.* (1994) but not by Amadon & Bull (1988) and Sibley & Monroe (1990).

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## A new subspecies of the Northern Beardless-Tyrannulet *Camptostoma imberbe*

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The Northern Beardless-Tyrannulet *Camptostoma imberbe* is a small tyrannid breeding from the southwestern United States to northern Costa Rica, beyond which it is replaced by the allospecies *C. obsoletum*. The English and scientific names of *C. imberbe* refer to the near absence in this genus of the rictal bristles typical of Tyrannidae.

Traylor (1979) recognized two subspecies of *C. imberbe*: a western form *C. i. ridgwayi* (Brewster) found from southern Arizona to Morelos

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\*Deceased.

*Senior author's note:* This description was one of many joint projects uncompleted at the time of Dr. Phillips' death. I have compiled it from detailed notes left at the Carnegie Museum of Natural History by Dr. Phillips.